

Balanced type stepper

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a balanced type stepper, more particularly pertains to an improved stepper focusing on overcoming the shortcomings of the large size of the conventional stepper and the tendency of the pedal being inclined forward. The stepper in accordance with this invention comprises a H-shape base, a V-shape support stand being pivotally coupled to the H-shape base by adjustable left and right link bars with a fixing board, a side link bar and a lower link bar respectively disposed at the left and right ends of each link bar to constitute a mechanical structure having interconnected link bars with the fixing board, a pedal being installed at the top end of the side link bar, and a bolt disposed at the bottom of the outer end of the support stand, and a buffer oil-pressure cylinder not parallel with the support stand being pivotal coupled between the bolt and the fixing board, such that when users step on the pedals, and exert force alternately on the left and right pedals to drive the side link bar to produce the inclination to the left and right sides and the vertical and horizontal displacements of the pedal by the V-shape support stand coupled with the adjustable link bars, and thus pulling the link rod of the buffer oil-pressure cylinder to produce the expansion and contraction and producing different resistance to provide the sideway swing and vertical and horizontal movements of the stepping, and also being capable of changing the length of the adjustable link rod as well as the height and position of the pedal in order to change the swinging amplitude to provide changes to the stepping distance and fit different users and the use of long hour training.

Description of the Related Art

Since people are paying more attention to health day after day and the living standard is constantly improved, in addition to the unbalanced diet, the use of sports equipments become more extensive. The stepper used for sports and fitness is basically divided into two types, one being the lever and buffer type structure and the

other being the crank and link rod type structure. However, both types of these
steppers have the shortcomings of large volume and complicated structure.
Furthermore, when the pedal is moved during the exercise, the pedal tends to incline
forward, and thus easily causing unbalance and being insecure. Therefore, it requires
5 further studies, designs, and improvements.

In view of the description above, the inventor of this invention based on years of
experience on engaging in the design and manufacture of sports and fitness equipment
and focused on the foregoing shortcomings to conduct extensive studies and
experiments and finally invented the balanced type stepper in accordance with this
10 invention.

Summary of the Invention

The primary objective of the present invention is to provide a balanced type
stepper, comprising a H-shape base, a V-shape support stand being pivotally coupled
to the H-shape base by adjustable left and right link bars with a fixing board, a side
15 link bar and a lower link bar respectively disposed at the left and right ends of each
link bar to constitute a mechanical structure having interconnected link bars with the
fixing board, a pedal being installed at the top end of the side link bar, and a bolt
disposed at the bottom of the outer end of the support stand, and a buffer oil-pressure
cylinder not parallel with the support stand being pivotal coupled between the bolt and
20 the fixing board, such that when users step on the pedals, and exert force alternately
on the left and right pedals to drive the side link bar to produce the inclination to the
left and right sides and the vertical and horizontal displacements of the pedal by the
V-shape support stand coupled with the adjustable link bars, and thus pulling the link
rod of the buffer oil-pressure cylinder to produce the expansion and contraction and
25 producing different pressure resistance to provide the sideway swings and vertical and
horizontal movements of the stepping, which can eliminate the unbalance and the
feeling of insecurity.

The secondary objective of this invention is to provide a balanced stepper, of

which the adjustable link rod connected to the support stand with the left and right link bard is designed in the shape of a handle for carrying and moving the stepper. Further, the adjustable link bar can be rotated to adjust the length, and also change the included angle between the left and right link bars of the support stand in order to
5 adjust the height and position of the pedal, the vertical swinging of the pedal, and the stepping distance to fit different users and the use of long-hour practice.

BRIEF DESCRIPTION OF THE DRAWINGS

Other features and advantages of the present invention will become apparent in the following detailed description of the preferred embodiments with reference to the
10 accompanying drawings, in which:

FIG.1 is a perspective diagram of a preferred embodiment of the present invention.

FIG.2 is a side-view diagram of a preferred embodiment of the present invention.

FIG.3 is an illustrative diagram of the application of a preferred embodiment of
15 the present invention.

FIG.4 is a cross-sectional diagram of the handle and the upper link rod adjusting structure of a preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

To make it easier for our examiner to understand the objective of the invention, its
20 structure, innovative features, and performance, we use a preferred embodiment together with the attached drawings for the detailed description of the invention.

Please refer to FIGS. 1 to 3 for the present invention, comprising a base 1, a support stand 2, a fixed board 11, a buffer oil-pressure cylinder 5, an adjustable link bar 6, a side link bar 22, a lower link bar 23, and a pedal 4; wherein the base 1 is a
25 H-shape frame set on the floor, and a fixed board 11 is disposed in the middle, left and

right V-shape support stands 2 are pivotally coupled to an adjustable link rod 6 transversally to the fixed board 11, and the left and right ends of the each support stand 2 respectively use the side link bar 22, the lower link bar 23, and the fixed board 11 to constitute a linking mechanical structure with four link bars interconnected pivotally. A pedal 4 is disposed on the top end of the side link bar 22, a bolt member 51 is disposed at the bottom of the outer end of the left and right support stands 2, and a buffer oil-pressure cylinder 5 not parallel to the support stand being disposed between the bolt member 51 and the fixed board 11. A rubber pad 12 may be installed at an appropriate position between the base 1 and the lower link bar 23, if needed, to avoid collisions between the bolt 51 and the fixed board 11. Furthermore, the adjustable link bar 6 coupled to the left and right link bars of the support stand 2 can be designed in the shape of a handle 3 for carrying and moving the stepper. By designing the handle 3 as a contractible and expansible structure (as shown in FIG. 4), it can adjust the length by rotating the adjustable link bar 6, and also can drive and change the included angle between the left and right link bars of the V-shape support stand 2 to adjust the height and position of the pedal 4 as well as the swing amplitude of the pedal 4 to provide adjustments to the stepping distance.

In the actual operation during its use, the stepper in accordance with this invention is set on the ground first, and then users can rotate the handle to drive the adjustable link bar to contract or expand into the desired stepping distance, and change the included angle of the left and right link bars of the support stand 2 and the height and position of the pedal 4. The user steps both feet individually on the pedal 4 and exerts force alternately by the left and right legs to move the level of the exerted pedals downward, and the side-link bar 22 fixed on the pedal will be driven to incline the adjustable link bar 6 connected to the V-shape support stand 2 to the left and right side. The aslant support stand 2 will also drive the side link bar 22 and the pedal 4 on that end to move upward to produce the opposite vertical and horizontal movements. At that time, the side link bar 22 will also drive the support stand 2 such that the bottom of the bolt member 51 will pull the buffer oil-pressure cylinder 5 not parallel to the support stand 2 and produce the contraction and expansion for the link bar 50

and produce different resistances, and thus accomplishing the movements by sideway swings and vertical and horizontal stepping. When the base 1 and the lower link bar 23 are about to collide, the rubber pad 12 installed between them will provide the buffer and blocking action to prevent any collision, vibration, or noise which may bring uncomfortable and inconvenient results. If it is necessary to carry or move the stepper, the handle 3 installed on the V-shape support stand 2 provide a simple, convenient, and quick operation.

Since the structure and device of the present invention have never been disclosed in the market or publication, the present invention capable of accomplishing the exercise by horizontal sideway stepping as well as having the features of fitting different use and long-hour training definitely improves the performance of traditional steppers, and fully complies with the requirements for the patent application.

While the present invention has been described by the most practical and preferred embodiments, it is understood that this invention is not limited to the disclosed embodiments but is intended to cover various arrangements included within the spirit and scope of the broadest interpretations and equivalent arrangements.